Swift Creek TMDL Implementation Plan
Upstream Lake Blackshear
Crisp County, Georgia
Fecal Coliform Bacteria
HUC #0313000606

September 30, 2004

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Crisp County – Middle Flint River Basin
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Background

The State of Georgia assesses its water bodies for compliance with water quality standards criteria as required by the Federal Clean Water Act (CWA). Assessed water bodies are placed into one of three categories; supporting, partially supporting or not supporting their designated uses depending on water quality assessment results. These water bodies are placed on Georgia's 305(b) list as required by that section of the CWA that addresses the assessment process, and are published every two years in *Water Quality in Georgia*.

Some 305(b) partially supporting and not supporting water bodies are also assigned to Georgia's 303(d) list, also named after the corresponding section of the CWA. Water bodies on the 303(d) list are required by the CWA to have a Total Maximum Daily Load (TMDL) evaluation because samples taken from them exceed water quality standards for any of numerous contaminants. Swift Creek, on the Crisp/Worth County line, was one of many in the Flint River basin found to be in violation of water quality standards for fecal coliform bacteria. Based on analysis of water quality samples, the TMDL calls for a 48% reduction in fecal coliform bacteria; from1.46E+12 to 7.6E+11.

The TMDL process establishes the allowable loading of pollutants or other quantifiable parameters for a water body based on the relationship between pollution sources and in-stream water quality conditions. This allows water quality-based controls to be developed to reduce pollution and restore and maintain water quality.

Water samples were collected by the Environmental Protection Division (EPD) of the Georgia Department of Natural Resources from February through October, 2000, at trend monitoring station #11062771 located at Primrose Bridge Road[1] near Warwick (Worth County). The 303(d) listing includes the seven mile segment of Swift between backwaters of Lake Blackshear and the Turner County line (refer to map in rear of document).

Environmental Parameter

Fecal coliform bacteria are indicators of a potential public health risk, and not an actual cause of disease. These bacteria have been traditionally used by public health authorities to indicate health risk from a wide range of living organisms too small to be seen with the naked eye (microbes), and to set water quality standards for drinking water, shellfish consumption and water contact recreation.

[1] The TMDL Evaluation (1/03) refers to this as Jamestown Road

Fecal coliform bacteria suggest the co-presence of bacterial pathogens (disease-causing microbes) which can cause dysentery, gastrointestinal illness, cholera, typhoid fever and staph infections. The actual risk of contracting a disease from a pathogen depends on a host of factors, such as the method of exposure or transmission, pathogen concentration, incubation period and the age and health status of the infected party.

Fecal coliform are an imperfect indicator of water safety, and regulators debate whether other bacterial species are better indicators of potential health problems. The debate remains largely academic; however, as over 90% of states still rely on fecal coliform, in whole or in part, as their recreational water quality standard.[2]

The water safety standard used by the State of Georgia for fecal coliform bacteria is based on a 30-day geometric mean (at least four samples collected during a thirty day period at intervals of not less than twenty-four hours) of 200 cfu/100 ml for water samples collected during the six (summer) month period May through October, inclusive, and a 30-day geometric mean of 1,000 cfu/100 ml (with a maximum of 4,000 cfu/100 ml) for water samples collected during the (winter) months of November through April, inclusive[3]. The geometric mean is a statistical method used to adjust for great variability in sample values; a common characteristic of fecal coliform bacteria.

As data in the following table indicates, one of the four geometric means (255 cnts/100ml) exceeds applicable water quality standards for the summer months. Consequently, Swift was classified as partially supporting the creek's designated use for fishing.

Swift Creek Water Quality Sampling Data
HUC # 0313000606
monitoring station #11062771

Date	Observed Fecal Coliform (counts/100 ml)	Estimated Instantaneous Flow On Sample Day (cfs)	Estimated Fecal Coliform Loading on Sample Day (cnts/30 days)	Geometric Mean (cnts/100 ml)	Mean Flow (cfs)	Geometric Mean Fecal Coliform Loading (cnts/30 days)
23-Feb-00	20	40.00	5.87E+11			
1-Mar-00	70	47.00	2.41E+12			
8-Mar-00	70	31.00	1.59E+12			
15-Mar-00	130	37.00	3.53E+12	60	38.75	1.70E+12
24-May-00	170	19.00	2.37E+12			
7-Jun-00	70	14.00	7.19E+11			
15-Jun-00	170	12.00	1.50E+12			
12-Jul-00	80	8.20	4.81E+11	113	13.30	1.10E+12
16-Aug-00	70	5.50	2.82E+11			
30-Aug-00	130	5.20	4.96E+11			
6-Sep-00	1400	5.70	5.85E+12			
12-Sep-00	330	6.30	1.53E+12	255	5.68	1.06E+12
12-Sep-00	330	6.30	1.53E+12			
19-Sep-00	130	6.30	6.01E+11			
4-Oct-00	20	5.90	8.66E+10			
11-Oct-00	50	5.70	2.09E+11	81	6.05	3.59E+11

Source: Total Daily Maximum Daily Load Evaluation for Twenty-Eight Stream Segments in the Flint River Basin for Fecal Coliform, GA. DNR-EPD, January 2003

[2] Watershed Protection Techniques, vol..3, no.1, April, 1999

[3] coliform units/100 milliliters

It is well documented that fecal coliform bacteria counts typically increase immediately after rain events, in part because naturally occurring fecal coliform bacteria present across the landscape are flushed into nearby surface waters. Consequently, static-state conditions (not influenced by rainfall) are preferred for collecting water samples used in water quality analysis.

As the preceding table reveals, the highest bacteria count (1400) was collected September 6. According to the Record of River and Climatological Observations at the nearest recording station,[4] a .67 inch rainfall occurred the date of collection, but it is not known the time of day the rainfall occurred or time of day the sample was taken. The second highest bacteria count (330) was recorded September 12. The recording station documented no rainfall on that date or the three days immediately preceding.

Watershed Description

The subject watershed, Hydrologic Unit Code (HUC) 0313000606 (-06) is comprised of three, twelve-digit sub-basins (refer to map in rear). The longer portion of the seven mile impairment is located in HUC 031300060608 (-608). This "primary" sub-basin is approximately 9,600 acres in size. The balance of the impairment is located in HUC 031300060610 (-610), referred to here as the secondary HUC, which covers approximately 12,600 acres and is the site of the creek's discharge into Lake Blackshear. The third sub-basin, HUC 031300060609 (-609) covers approximately 11,800 acres. The three HUCs converge at the site of the 2000 water quality sampling. Topography is flat; typically less than 3% slope. Swift Creek comprises most of the boundary between Crisp and Worth Counties.

Land Use

Agricultural land comprises the majority of HUC -06, and an additional thirty-five to forty percent of the watershed is wooded. Most of the woodland is in relatively small acreages dispersed around that land better suited for intensive agricultural production. The balance of the watershed is roadway, residential (scattered rural residential with small concentrations on Lake Blackshear backwater, in Warwick and Arabi) and very limited commercial. Development essentially stops at the end of the lake's backwater; there is very little on Swift Creek.

Total estimated population in the watershed is approximately 2000; 160 in HUC -608; 350 in HUC -609; and 1,480 in HUC-610, the latter of which includes 430 residents of the City of Warwick (2000 Census). Approximately 1130 housing units are distributed throughout these sub-basins, for an average of approximately 30 acres per residence.

Source Assessment

Pollution originates from two broad sources; point sources and nonpoint sources. A point source is defined as a discernable, confined, and discrete point or site from which

[4] Catahoula Farm, Crisp County; approximately 13 air miles north of the impaired segment

pollutants are discharged into surface waters. Examples of point sources are municipal and industrial wastewater treatment plants. These sources have been addressed through the federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) permit program and are not the subject of this implementation plan.

The second broad category of pollution is nonpoint sources. These are diffuse and generally involve accumulation of fecal coliform bacteria on land surfaces that wash off as a result of rain events. In general, nonpoint sources cannot be identified as discharging wastewater into a water body at a single location. Typical nonpoint sources of fecal coliform bacteria include:

Wildlife	Agricultural Livestock	Urban Development
	Animal grazing/confinement	Leaking septic systems
	Animal access to streams	Land application systems
	Use of manure on crop/pasture	Landfills
		Storm sewers

Wildlife

The impacts of wildlife as a source of fecal coliform bacteria in streams vary considerably, depending on the animal species and numbers present in the watershed. Animals that spend a large portion of their time in or around aquatic habitats are considered to be the most significant wildlife contributors of fecal coliform bacteria.

Stakeholder input included concern about increasing populations of geese and buzzards along the banks of Swift Creek, particularly that portion nearest the lake. The Georgia Department of Natural Resources (DNR) restocked geese in the area in the mid- to late 1980's. Approximately 800-1,000 birds were released in the Middle Flint Region; 18 – 20 pair of which were released at Lake Blackshear. DNR described the repopulation effort as successful with geese at stable numbers, although the current population is not known. Some area residents complained the buzzard population has increased to a nuisance level.

Stakeholders also reported a "significant" feral hog population in the primary sub-basin. Feral hogs are adaptable to almost any habitat, but prefer wooded areas close to water. Lacking sweat glands they regulate body temperature by lying in water or mud and cannot survive in hot climates without a plentiful supply of water. Their ability to thrive on a very diverse diet gives them a distinct survival advantage over other species. Because they are so prolific, adaptable, tenacious, and have no natural predators, it is difficult to control their population.

Much of the area along Swift Creek and its tributaries is attractive habitat to feral hogs. The creek is undeveloped and it is assumed such wildlife inhabit much of the riparian zone in the watershed. Areas elsewhere with significant feral hog populations have recorded high concentrations of fecal coliform bacteria.

According to 2000 deer census data of the Wildlife Resources Division of the Georgia Department of Natural Resources, there are approximately 35 deer per square mile (1/18 acres) in Crisp and Worth Counties. On the basis of this information, and assuming a relatively even distribution throughout the counties, it is assumed there are approximately 1900 deer in the watershed; (530 in HUC -608, 700 in HUC -610, and 650 in HUC -609).

Although deer are generally considered to be one of the less significant contributors of fecal coliform bacteria, the feces they deposit on the land surface can result in the introduction of fecal coliform to streams during runoff (rain) events. It should be noted that considerable decomposition of the fecal matter should occur between rain events, resulting in a decrease in the associated bacteria counts. This also holds true for other terrestrial mammals such as squirrel, rabbit and terrestrial birds.

Stakeholders also reported the presence of wild dogs and coyotes in the watershed.

Agricultural Livestock

Agricultural livestock are potential sources of fecal coliform bacteria whether on open pasture or in confinement. Cattle, sheep, horses, and goats grazing on pasture deposit feces onto the land surface from where it can be transported to nearby streams during rain events. Livestock on open grazing often have direct access to streams that pass through pastures, and as a result can impact water quality in a more direct manner. Confined animal feeding operations (CAFO), such as beef cattle in feedlots, poultry houses and confined dairy cattle and swine, generate large quantities of fecal material within a limited area with potential for significant bacterial runoff.

According to 2000 agricultural statistics, there were 3,380 head of beef cattle in Crisp County and 7,700 head in Worth County, the year water quality sampling occurred. The most recent published statistics (2002)[5] report virtually no change in herd size in either county, and stakeholders indicated no change in this agricultural activity in the watershed.

A beef cattle feedlot has operated for many years on the western corporate limits of the City of Arabi. Livestock are fattened on open grazing; there is no confinement. Herd size fluctuates considerably with the cattle market. "Significant" numbers can be placed on site when the market is down, and reduced to nominal numbers when the market rises. Consequently, there are extended periods of inactivity at the site.

These cattle have direct access to ponds on the site. The headwaters of a Swift Creek tributary flowing near this feedlot meander 7.5 miles before merging with Swift Creek at a point one mile upstream of the 2000 water sampling collection point. There are small cattle operations on pasture scattered throughout sub-basin -609; equivalent to approximately two head per acre. The combination of flat topography covered with grass greatly reduces the potential for pasture runoff.

[5] Georgia County Guide 2001 and Georgia County Guide 2003

Crisp County was credited with 3,400 head of swine in 2000, and 3,650 in 2002.[6] Worth County's swine numbers decreased from the 100 head documented in 2000.[7] Stakeholders could not identify the location of any swine in the watershed.

The only dairy farm credited by agricultural statistics to either county was not located in the watershed.

Agricultural statistics for 2000 reported 2.2 million broilers, breeding hens and laying hens distributed throughout Crisp County in 18 poultry houses, and 1.7 million broilers and laying hens in 14 houses in Worth. The most recent statistics (2002) report an increase of approximately 600,000 chickens throughout the watershed in the same number of houses.[8] None of these poultry houses are believed to be/have been located in the watershed.

Agricultural officials did report; however, that application of poultry litter on farmland is a common practice in the watershed. Unless the farmer applying litter to his land also raises poultry, the litter must be purchased just as any other soil enhancer; and like any other fertilizer must be incorporated soon after application to achieve maximum benefit. If the purchased litter is placed in exposed stockpiles on a field's edge until application, heavy rains could erode the stock piles and possibility result in run-off into nearby creeks.

The poultry industry has been promoting the use of nutrient management planning; matching nutritional value of poultry litter with the nutritional needs at any given application site. This refinement to existing best management practices further reduces the potential for bacterial runoff**.**

Urban Development

Neither of the two municipalities located within in the watershed have municipal wastewater disposal systems. Warwick's 180 housing units and Arabi's thirty housing units located in the watershed are all served by individual septic tanks. Warwick is downstream of Swift Creek, and at its nearest point Arabi is approximately 3.5 air miles from Swift Creek.

For TMDL purposes, septic tanks are considered an "urban" development. After solids are trapped in a septic tank and broken down via bacterial activity, wastewater is discharged through a subsurface drain (tile) field and allowed to percolate through the soil. If the system is properly located, installed and maintained, bacteria are effectively removed by a natural filtering process as water passes through the soil profile. Septic

[6] Georgia County Guide 2001 and 2003
[7] Georgia County Guide 2001 and 2003
[8] Georgia County Guide 2001 and 2003

systems fail when wastewater breaks out or passes through the soil profile without adequate treatment.

The causes of septic system failure are numerous; inadequate soils, poor design, siting, testing or inspection, hydraulic overloading, tree growth in the drain field, old age, and owner failure to clean the system. Among the factors officials should consider when investigating whether septic systems are likely to be a major bacteria source are age (systems older than twenty years) and small lots. The design life of most septic systems is 15-30 years, at which point major rehabilitation or replacement is often needed.

The development so common along the shoreline of Lake Blackshear's backwater essentially stops at the mouth of Swift Creek. A wide, tree-covered riparian zone parallels most of the creek and its tributaries, separating the water's edge from surrounding farmland. The majority of acreage along the creek has "moderate" to "severe" limitations for use as septic tank drain fields.[9] Crisp County Health Department officials are not aware of any septic problems; no complaints have been filed and there have not been any difficulty permitting tank placement along the backwater. Contamination of this area can be neither confirmed nor refuted without further testing.

When owners have septic systems cleaned, they most commonly contract with specialty contractors to pump the contents of the septic tank into a "honey pot"; a truck-mounted tank for transport to a proper discharge site. Although this waste material is required to be properly treated, at least one stakeholder reported witnessing the discharge of raw sewage from a "honey pot" into Swift Creek. The creek was also reported to have been used as a recreational vehicle "dumping station", though no one attending the stakeholder meeting reported having witnessed any such activity.

There are only three public roads crossing the creek along the full length of its impairment; helping limit development in the area. Fanns Bridge Road is near the western extremity of the impairment and lake backwater. Approximately two creek-miles upstream is Primrose Bridge Road. This is the site of the 2000 water quality sampling (monitoring station #11062771); referenced in the TMDL Evaluation document (1/03) as Jamestown Road. Approximately five creek-miles further upstream Georgia Highway 33 crosses the creek near the eastern extremity of the impairment. The headwaters extend approximately three miles further upstream in Turner County.

Land Application Systems

Many smaller communities use a land application system (LAS) for treatment of sanitary wastewater. State-issued LAS permits require the facilities to treat wastewater by land application and to have zero discharge. However, runoff during rain events may carry surface residual containing fecal coliform bacteria to nearby streams. No land application system has operated in the watershed.

[9] Soil Survey of Crisp and Turner Counties, USDA

Landfills

Leachate from landfills may contain fecal coliform bacteria and may at some point discharge into surface waters. Sanitary (municipal) landfills are the most likely type of solid waste disposal facility to be a source of fecal coliform bacteria. These facilities receive household wastes, animal manure, offal, hatchery and poultry processing plant wastes, dead animals, and other types of wastes. Older sanitary landfills were not synthetically lined, and those that remain active operate as construction/demolition landfills. Newer sanitary landfills are lined and have leachate collection systems. All landfills, except inert facilities, are now required to install environmental monitoring systems to sample groundwater quality.

Crisp County opened a sanitary/municipal landfill on the eastern extremity of sub-basin -609 in 1975. Originally operated as an unlined facility, the county responded to federal regulations requiring placement of synthetic liners in cells in the early 1990s. This site is approximately five air miles from the nearest point of Swift Creek. A tributary identified on the Department of Transportation General Highway Map of Crisp County as North Branch Swift Creek meanders from its headwaters in the immediate vicinity of the landfill a distance of approximately 6.5 creek miles to Swift Creek, the point where the 2000 samples were collected.

Storm Sewers

Large municipalities typically collect storm waters via a storm sewer system, and discharge the flow through distinct outlet structures into creeks and streams. Documented sources of non-human fecal coliform in urban watersheds include dogs, cats, raccoons, rats, beaver, gulls, geese and pigeons. Dogs in particular appear to be a major source of coliform bacteria and other microbes, because of their population density, daily defecation rate, and pathogen infection rates. Warwick and Arabi both have rudimentary storm sewer systems, comprised of open ditches. The only storm water piping in either city is at street and ditch intersections.

Other

Stakeholders reported the dumping of deer carcass and other dead animals in the creek, and expressed their concern over the absence of response from public officials when such activity was reported.

Findings

Although the water quality data presented in the 2003 TMDL Evaluation technically exceeded the applied threshold for listing (10% of samples), it is questionable whether 303(d) listing is appropriate. Eight of the fifteen samples collected[10] were below 100; five were below 200. The only two (13%) samples collected which exceeded the summer

[10] One sample (9/12) was recorded twice. It is assumed a sample could not be collected timely, or if collected became contaminated. Apparently, only fifteen samples were collected.

months threshold were taken during the period of lowest stream flow; influenced no doubt by a low rainfall total for the year (thirteen inches below normal)[11]. Other factors being static, the decreased stream flow may not have been sufficient to dilute by natural means what could be an "acceptable" fecal loading.

Stakeholder Involvement

Owners of land contiguous to the impaired segment of Swift Creek were identified from courthouse tax records. Local government, Farm Bureau, health department, forestry officials, and agricultural experts from the County Extension Offices and Natural Resources and Conservation Service were also identified. Letters of invitation to the August 12 meeting were mailed to twenty owners of creek-front properties and other stakeholders. Block ads were published in the Cordele Dispatch and the Albany Herald inviting public participation in development of this document. Fifty-four stakeholders were documented as attending the meeting held in the Warwick Community Center. The number in attendance actually exceeded 100, with stakeholders from the larger Lake Blackshear area also attending a subsequent meeting to discuss weed control problems in the lake and its backwaters.

The meeting opened with viewing of the fifteen-minute videocassette tape, *Water Quality In Georgia, The Total Maximum Daily Load Program*, after which the purpose of the meeting was clearly explained. The formal program also included a PowerPoint presentation of the watershed's characteristics. During the two-and-one-half hour meeting participants shared first-hand accounts of activities in the watershed that could be contributing sources of fecal coliform bacteria in Swift Creek, and suggested possible corrective measures. Their accounts are incorporated into this document.

Potential Funding Sources

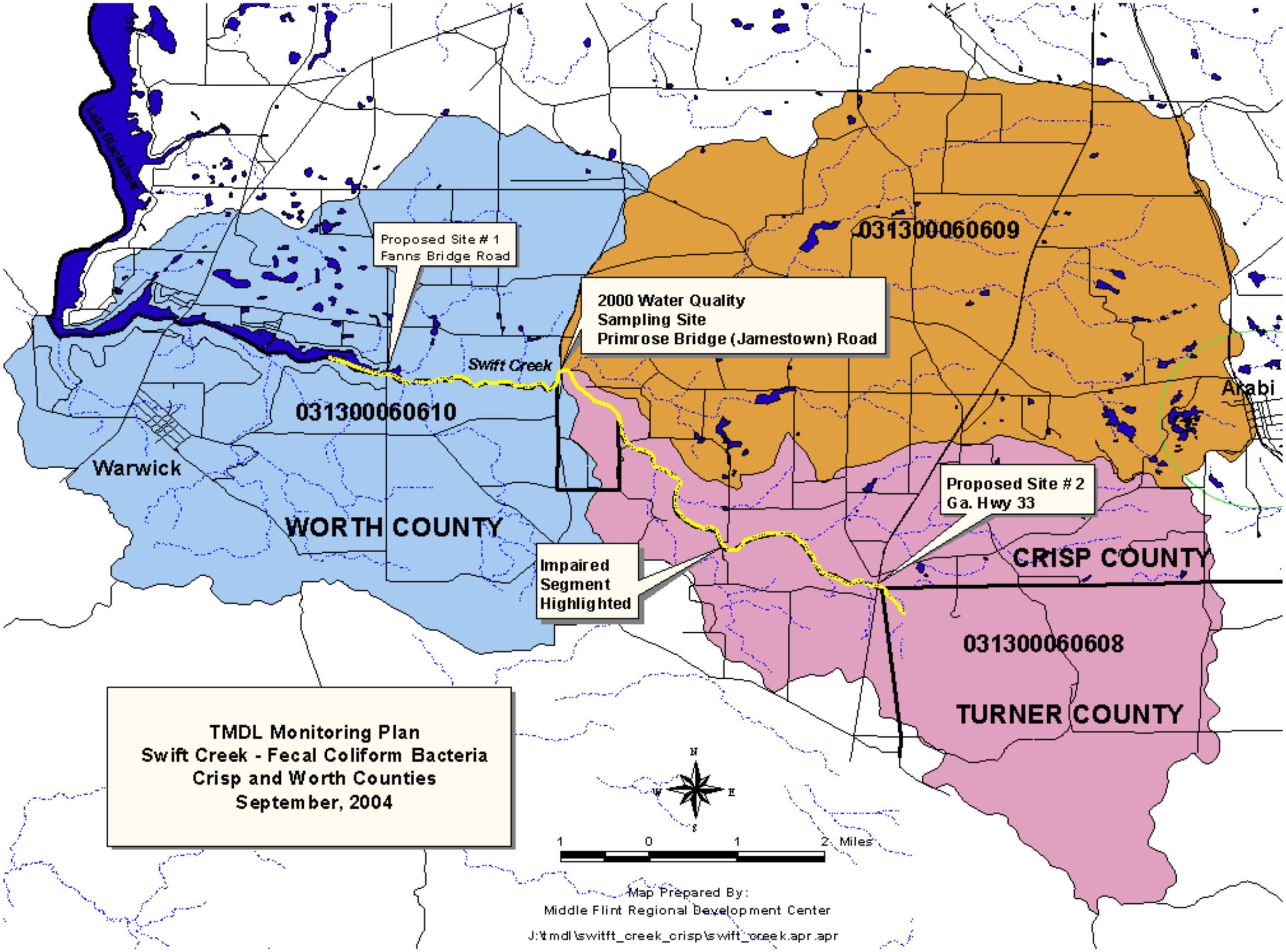
Georgia EPD
Watershed Assistance Grants
Volunteer Activities (Adopt-A-Stream)
Water Quality Cooperative Agreements
Nonpoint Source Implementation Grants (319)

[11] Georgia Automated Environmental Monitoring Network

Swift Creek – Fecal Coliform
Water Quality Sampling/Monitoring Plan
HUC 0313000606
(refer to map in rear of document)

Additional water sampling and analysis is proposed to help identify areas where efforts to locate possible contributors of fecal coliform loading are likely to be most beneficial. Proposed collection sites are presented in descending priority as follows:

Original Site 2000	Primrose Bridge Road – referred to as Jamestown Road in the TMDL Evaluation document (1/03). Analysis of additional samples taken at this site will be compared with 2000 sampling data to get an indication whether previously documented conditions still exist.
Proposed Site # 1	Fanns Bridge Road – approximately two creek miles downstream of the 2000 sampling site. The value of this location will be to determine fecal bacteria counts at the creek's point of discharge into backwaters of Lake Blackshear.
Proposed Site # 2	Georgia Highway 33 – approximately 5 creek miles upstream of the 2000 sampling site. The value of this location will be to determine how widespread the elevated counts may be. (If deemed necessary, additional creek access may be obtained via private field road approximately two creek miles downstream of this site.)
Optional Site	If funding is available and the need deemed sufficient, samples may also be collected immediately downstream of the cattle feed lot described in the text (page 5). Headwaters of a Swift Creek tributary originate on this property and cross the Arabi Warwick Road approximately 3,800 feet west of Arabi's western corporate limits. The culvert at this location is approximately 4,000 feet downstream of the feed lot. Although this site is not plotted on the accompanying project map, it is easily identifiable in HUC -609. This optional site is approximately seven creek miles from Swift Creek.


Lake Blackshear
Proposed Site # 1
Fanns Bridge Road
2000 Water Quality
Sampling Site
Primrose Bridge (Jamestown) Road
Swift Creek
031300060609
031300060610
Warwick
WORTH COUNTY
Proposed Site # 2
Ga. Hwy 33
Impaired
Segment
Highlighted
CRISP COUNTY
031300060608
TURNER COUNTY
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TMDL Monitoring Plan
Swift Creek - Fecal Coliform Bacteria
Crisp and Worth Counties
September, 2004
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Map Prepared By:
Middle Flint Regional Development Center
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STATE OF GEORGIA
TMDL IMPLEMENTATION PLAN FOR: SWIFT CREEK (STREAM) FECAL COLIFORM (PARAMETER) RIVER BASIN: MIDDLE FLINT
PLAN DATE: September 30, 2004

Prepared by: Gerald Mixon Middle Flint Regional Development Center Address: 228 West Lamar Street City: Americus State: GA Zip: 31709 e-mail: gmixon@middleflintrdc.org Date Submitted to EPD: September 30, 2004.	Or Prepared By: Address: City: State: Zip: e-mail: Date Submitted to EPD:

General Information	Significant Stakeholders
Obtain this information from the TMDL document or other information. When completed, this document will be a self-contained report independent of the TMDL document.	Identify local governments, agricultural organizations or significant land holders, commercial forestry organizations, businesses and industries, and local organizations including environmental groups with a major interest in this water body. Additional stakeholders identified on page 17.

TMDL ID (to be entered by EPD)		Name/Organization	Crisp County Board of Commissioners				
Water body name	Swift Creek	Address	210 South 7th Street				
HUC basin name	Lake Blackshear	City	Cordele	State	GA	Zip	31015
HUC number	0313000606	Phone	229-276-2672			e-mail	
Primary county	Crisp	Name/Organization	Crisp County Extension Service				
Secondary county	Worth	Address	110 W. 13th Avenue, Suite C				
Primary RDC	Middle Flint	City	Cordele	State	GA	Zip	31015
Secondary RDC	Southwest Georgia	Phone	229-276-2612			e-mail	
Water body location	Upstream Lake Blackshear	Name/Organization	Crisp County Farm Bureau				
		Address	302 South Pecan Street				
Miles or area impacted	7 miles	City	Cordele	State	GA	Zip	31015
Parameter addressed in plan	Fecal coliform	Phone	229-273-3160			e-mail	
Water use classification	Fishing	Name/Organization	Crisp County Health Department				
Degree of impairment	Partially supporting use X	Address	111 East 24th Avenue				
	Not supporting use	City	Cordele	State	GA	Zip	31015
Date TMDL approved by EPA		Phone	229-276-2180			e-mail	
Impairment due to	Point sources	Name/Organization	Natural Resource Conservation Service				
	Nonpoint sources X	Address	110 West 13th Avenue				
	Both	City	Cordele	State	GA	Zip	31015
Point source-Form A; Nonpoint source-Form B; Both-Form A+B+C		Phone	229-273-4148			e-mail	

SUMMARY OF ALLOCATION MODEL RESULTS FROM TMDL DOCUMENT (existing load, target TMDL, and needed reduction)

EXISTING LOAD	TARGET TMDL	NEEDED REDUCTION
1.46E+12 30 days	7.6E+11 30 days	48%

I. IDENTIFY NONPOINT SOURCE CATEGORIES AND SUBCATEGORIES OR INDIVIDUAL SOURCES WHICH MUST BE CONTROLLED TO IMPLEMENT LOAD ALLOCATIONS:

List major nonpoint sources contributing to impairment, including those identified in TMDL document. *

SOURCE	DESCRIPTION OF CONTRIBUTION TO IMPAIRMENT	RECOMMENDED LOAD REDUCTION (FROM TMDL)
Although the Swift Creek TMDL Evaluation described typical nonpoint sources of fecal coliform bacteria, the specific contributor(s) of excessive fecal bacteria were not identified. In the absence of more extensive water quality sampling, it is not yet possible to definitively identify which source(s) needs specific attention and reduction. Based on general information collected during the development of this plan, more information is needed on the following possible sources.		
Wildlife	Possible wildlife and associated activities	48% (est)
Agriculture	Possible poultry litter and feedlot runoff	48% (est)
Septic Tank Service	Possible improper disposal of raw sewage by septic tank pumpers (honey pots) and recreational vehicle owners	100%

* No contributing sources were identified in the TMDL Document.

II. DESCRIBE ANY REGULATORY OR VOLUNTARY ACTIONS INCLUDING MANAGEMENT MEASURES OR OTHER CONTROLS BY GOVERNMENTS OR INDIVIDUALS THAT WILL HELP ACHIEVE THE LOAD ALLOCATIONS IN THE TMDL:

Existing or required regulatory actions

RESPONSIBLE GOVERNMENT, ORGANIZATION OR ENTITY	NAME OF REGULATION/ORDINANCE	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS
Crisp Co Health Dept.	State rules and regs. for on-site sewage mgt. sys.	Regulates installation of septic tanks	01-98	active
Crisp County Board of Commissioners	Groundwater Recharge Area Protection Ord.	Regulate development in areas of significant groundwater recharge	07-01	active
Worth Co Health Dept.	State rules and regs. for on-site sewage mgt. sys.	Regulates installation of septic tanks	01-98	active

GA EPD	Concentrated Animal Feedlot Operations	Enforcement of wastewater treatment regulations applicable to feedlot operations	09-74	enforced as needed
GA DNR Wildlife Resources	Hunter Education	Hunter safety & stewardship	-	-

Existing voluntary actions

RESPONSIBLE ORGANIZATION OR ENTITY	NAME OF ACTION	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS
Ag producers	Best Management Practices	Maximizing production without causing deleterious effects on other resources	1990s	active
Ag producers	Nutrient Management Plans	Purchasers of poultry litter match nutrient needs of land to nutrient value of litter	2000	active
Soil and Water Conservation District	Promote voluntary adoption of agricultural best management practices	Provide leadership in the protection, conservation, and improvement of soil, water and related resources	1937	active
USDA Natural Resources Conservation Service (NRCS)	Environmental Quality Incentives Program and other T/A	Develop standards and specification regarding conservation practices, animal waste management systems, grazing activities, et. al. – implements state priorities.	1997	needs increased funding
Cooperative Extension Service	Disseminate information/technical assistance	Consultative assistance, information on nonpoint-related impacts on water quality, water quality monitoring, analysis of nutrients and other constituents in animal waste, nutrient management plans	1914	active
Farm Services Agency (FSA)	Water quality improvement practices (Conservation Reserve Program)	Administration of cost-sharing and incentive programs for practices that improve environmental quality of farms. Funds targeted for high-priority watersheds with water quality problems.	1985	active
Georgia Department of Agriculture	Disease control	Provides guidance in location of animal waste facilities and disposal of dead animals	1974	as needed

USDA Agricultural Research Service (ARS)	Agriculture research and monitoring	Research on grazing land systems and irrigation methods relevant to watershed-scale monitoring projects and nutrient movement in surface water and groundwater.	-	as needed
Resource Conservation and Development Council	Volunteer activism	Citizen activism in conservation of natural resources	1962	as needed

Additional recommended regulatory or other measures which should be implemented to reduce the loads of the TMDL parameter

ENTITY/ORGANIZATION RESPONSIBLE	NAME OF PROPOSED REGULATION/ORDINANCE/ OTHER	DESCRIPTION	ENACTED OR PROJECTED DATE (mm/yy)	STATUS
GA DNR-Wildlife Resources	Hunter Education	Educate hunters of the environmental harm of improper disposal of wild game carcasses.	Year 1-5	Pending plan approval
GA DNR-Wildlife Resources	Wildlife Survey	Determine whether wildlife presence is sufficient to be significant contributor.	Year 2-5	Pending plan approval
Crisp and Worth County Extension	Survey of Agricultural Use of Poultry Litter	Survey to determine the extent to which poultry litter is applied to farmland & BMP implementation	Year 2-3	Pending plan approval
Crisp County Extension	Survey BMP Implementation	Survey implementation of livestock feedlot BMPs	Year 2-3	Pending plan approval
County Health Department and Tag Office	Permit Holder/Licensee Information	Inform (permitted) septic tank pumpers and RV owners of environmental harm of, and penalties for, improper disposal of untreated waste material	Year 2-5	Pending plan approval

III. SCHEDULE FOR IMPLEMENTING MANAGEMENT MEASURES OR OTHER CONTROL ACTIONS:

These must be implemented within five years of when the implementation plan is accepted by EPA.

IMPLEMENTATION ACTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Form stakeholders group	X				
Organize implementation work with stakeholders and local officials to identify remedial measures and potential funding sources	X	X			
Identify sources of TMDL parameter		X	X		
Develop management programs to control runoff including identification and implementation of BMPs (for livestock feedlot) (Phase I): Agriculture	X*	X*			
Forestry	n/a				
Urban	n/a				
Mining	n/a				
Organize and implement education and outreach programs		X*	X*	X*	
Detect and eliminate illicit discharges		X*	X*		
Evaluate additional management controls needed		X	X	X	
Monitor and evaluate results		X	X	X	
Reassess TMDL allocations				X	X
Provide periodic status reports on implementation of remedial activities			X	X*	X*
If needed, begin process for Phase II (next 5 years) and subsequent phases					X

* as needed

IV. PROJECTED ATTAINMENT DATE AND BASIS FOR THAT PROJECTION:

The projected attainment date is 10 years from acceptance of the implementation plan by EPA.

V. MEASURABLE MILESTONES:

- Number of management controls and activities already implemented ____14___

- Number of management controls and activities proposed in five-year work program ____5___

- Number of management controls and activities actually implemented in five-year work period (to be completed after 5 years)

- Stream sampled to identify areas of concern See monitoring plan

VI. MONITORING PLAN:

Describe previous or current sampling activities or other surveys to detect sources or to measure effectiveness of management measures or other controls.

ORGANIZATION	TIME FRAME	PARAMETERS	PURPOSE	STATUS
Georgia EPD/DNR	2/00 – 10/00	Fecal Coliform	Watershed Basin Plan	State schedule

Describe any planned or proposed sampling activities or other surveys. (Scheduled EPD sampling can be found in the Basin Planning document.)

ORGANIZATION	TIME FRAME	PARAMETERS	PURPOSE	STATUS
EPD	2005	Fecal Coliform	Watershed Basin Planning	State schedule
As yet undetermined	Year 2, 3 (2006, 2007)	Fecal Coliform	TMDL implementation - establish base flow, confirm fecal presence and identify source(s)	Pending plan approval and funding

VII. CRITERIA TO DETERMINE WHETHER SUBSTANTIAL PROGRESS IS BEING MADE:

- % concentration or load change (monitoring program)
  48% reduction in loading and/or resultant concentrations

- Categorical change in classification of the stream
  delisting is the goal of this TMDL plan

- Regulatory controls or activities installed
  Additional water quality sampling
  Supplement Georgia Hunter Education curriculum stressing environmental stewardship
  Perform wildlife survey
  Survey agricultural use of poultry litter
  Survey feedlot BMP
  Program to inform septic tank pumpers and RV owners of environmental harm and penalties for improper waste disposal

Additional Stakeholders from page 11:

Public Stakeholders

Rusty Harris, Worth County Extension Service
Gina Connell, Worth County Health Department
Keith Willis, Farm Services Agency, Worth County
John Cox, Chief Forest Ranger, Worth County
Dan Miller, Chairman, Worth Count y Board of Commissioners
Ken Lewis, Crisp County Extension Service
Alicia Parker, Crisp County Health Department
James R. Dowdy, Jr., Chairman, Crisp County Board of Commissioners
Ranger First Class Harold Hill, DNR Region V
Dr. William L. Tietjen, Georgia Southwestern State University
John Hobbs, Farm Services Agency, Crisp County
Corporal Danny Bishop, DNR Region V

Private Landowners-Crisp County

Mark C. Johnson
Peggy J. Gregory
Nella Scott Raines
Houston Baptist Church
Lummie G. Moore
Mrs. Lutrelle J. Davis
David & Edwyna Crane
Deborah A. & Willie C. Marler
Vera C. McKinney & Lonnie Thomas
Kathy & Ruber K. Dyer, Jr.
A. J. Collins
Andrew R. & Betty Griffin
Roy F. & Frances A. Johnson
Billy Clary
Deborah A. Allen
J. O. & Doris M. Hall
Jacqulyn Wade Walters
Wylie G. Sheppard, Jr.
Sara Carolyn Wade Hall
T. A. Johnson
Texanne Brown
Vera C. McKinney & Lonnie

Private Landowners-Worth County

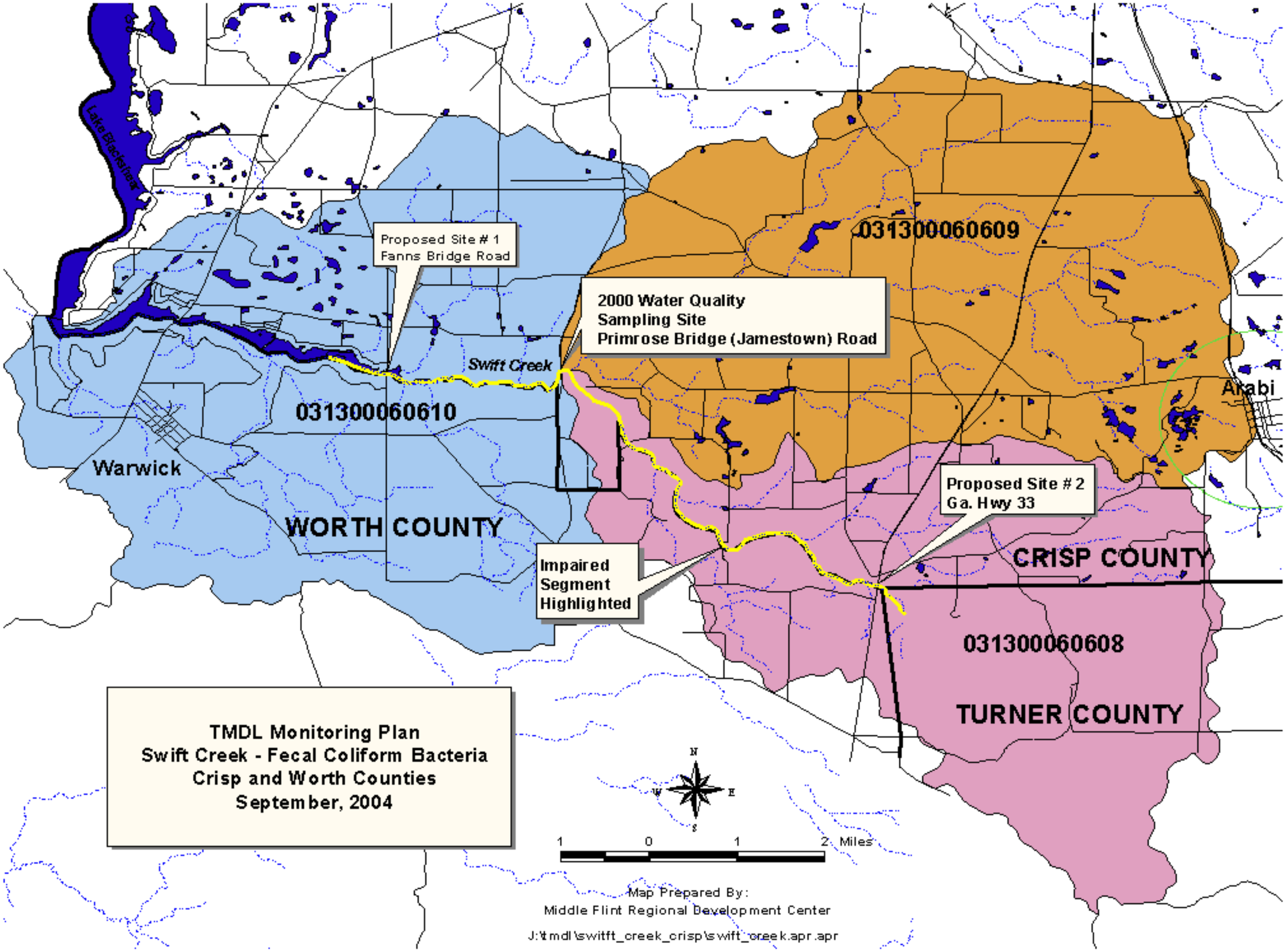
Nella Scott Raines
William John Wall & Others
Jacqulyn Wade Walters
Chambers Farms, Inc.
Shelly J. Thomas Sears
T. A. Johnson
Marvin Lewis
Helen Newsome Spooner & Others
Matthew R. & Sheila Farquhar
Johnny Ingram Johnson & Peggy J. Gregory

Swift Creek TMDL Fecal Coliform
HUC 031300060606
Crisp and Worth Counties
1994 photography

031300060609

031300060610

031300060608


Lake Blackshear
Proposed Site # 1
Fanns Bridge Road
2000 Water Quality
Sampling Site
Primrose Bridge (Jamestown) Road
Swift Creek
031300060609
031300060610
Warwick
WORTH COUNTY
Proposed Site # 2
Ga. Hwy 33
Impaired
Segment
Highlighted
CRISP COUNTY
031300060608
TURNER COUNTY
Arabi
TMDL Monitoring Plan
Swift Creek - Fecal Coliform Bacteria
Crisp and Worth Counties
September, 2004
N
W
E
S
1 0 1 2 Miles
Map Prepared By:
Middle Flint Regional Development Center
J:\tmdl\swiftt_creek_crisp\swift_creek.apr.apr